

YINAN (STEVE) LIU

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Education

Johns Hopkins University, Robotics	2023.08-2025.05
Monash University, Material Engineering, 4.0 / 4.0	2016.03-2017.12
Wuhan University of Technology, Material Engineering, 3.78 / 4.0	2013.09-2018.01

Skills

- Proficient at using Creo, Solidwork, Comsol, Abaqus, Minitab
- Proficient in C, C++, Python, Matlab
- Language skills: Chinese (native), English (fluent)

Patents

1. Liu, Yanan. 2022. Spine-Robotic Related Patent. PCT/CN2022/082933, filed Mar. 25, 2022. Patent unpublished.
2. Liu, Yanan. 2020. Monopolar Surgical Apparatus. PCT/CN2020/087235, filed Apr. 27, 2020, and issued Nov. 04, 2021.
3. Liu, Yanan. 2019. Electrosurgical Systems. PCT/CN2019/099590, filed Aug. 07, 2019, and issued Feb. 11, 2021.

Work Experience

Medtronic 2018.01-2023.07

Product: Spine Robotics and Optical Navigation System Sr System Verification Engineer

- Designed and validated a robotic image correction adapter to make it compatible with more than 3 brands and 15 medical imaging devices
- Built the robotic arm control platform and control system, and successfully calibrated the robotic arm based on an open-loop, least-square, kinematic algorithm through a portable coordinate measurement machine. The absolute accuracy of the calibrated robotic arm can reach 0.7mm
- Tested the Target Registration Accuracy (TRA) of the NDI optical navigation system based on Michael Fitzpatrick’s statistical theory and designed a high TRA passive tracker
- Co-worked with several automation suppliers such as BECKHOFF and Stäubli to evaluate system-level architecture solutions
- Worked with clinical experts to evaluate the surgical procedure expansion of the robotic system

Product: Electro-surgical System and Energy Device Product Engineer

- Developed the pneumatic manifold in the electrosurgical system with Camouzzi, Parker Hannifin, and Bürkert. Completed the verification including verification plan according to the design requirements to evaluate the function, reliability, compliance of the pneumatic subsystem
- Developed a Host GUI Program with PID controlling algorithm, to control valve manifold, and quickly verified and iterated 3 times in 2 months
- Used Abaqus for multiple fluid simulations, and combined results of the physical experiments to determine the nozzle design key parameters
- Used Abaqus simulated the Joule Thompson Effect generated by the High-Pressure Regulator to determine the best heat source and power to address dew effects
- Designed and validated an automated test platform for nozzles of different designs. Captured and analyzed the real-time dynamic in products instantaneously using a high-speed camera and auto-capture algorithm, and the results are transformed into the common metric system through a camera calibration algorithm

Product: Ultrasonic Scalpel Associate Product Engineer

- Analyzed the piezoelectric effect and thermal effect of the product to optimize product design parameters using COMSOL
- Proposed multiple optimization schemes for product design, including the replacement of piezoelectric ceramic suppliers and the testing of new supplier samples (key parameters: Qm (mechanical quality factor), d33), and waveguide parameters change
- Assisted Senior Engineer and Advanced Manufacture Engineer to develop the ultrasonic welding process of the transducer by optimizing and adjusting the joining position to achieve no machining defects and good sealing process parameters
- Designed a more convenient device debugging tool so that Technical Service engineers can find out the faulty components through a simple test, and then carry out targeted maintenance or replacement of the product